

Molecular Programs as Formal Systems

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Abstract

Natural Computing has as main objective the simulation and implementation of natural processes which can be interpreted as computing procedures. A molecular computation model is a model devoted to programs: the data structures are some objects called *tubes* and the primitive molecular instructions are based on operations with DNA molecules that can be implemented in the laboratory. Given P a molecular program of a filtering model (any computation starts with an initial tube including molecules encoding all possible solutions to the problem to solved, then it proceeds by filtering out strings which can not be a solution), designed to solve an existential decision problem X , we associate with it a formal system in such a manner that to verify if P solves X is equivalent to establish the soundness and completeness of the associated formal system.